

Supplement of Biogeosciences, 15, 4575–4592, 2018
<https://doi.org/10.5194/bg-15-4575-2018-supplement>
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Supplement of

Environmental drivers of soil phosphorus composition in natural ecosystems

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Supplement - Soil phosphorus dynamics on terrestrial natural ecosystems

Supplement S1 – Dataset: The dataset reference is provided.

Supplement S2 – Global biomes comprised in our dataset according to the Whittaker' diagram.

Supplement S3 – Soil depth effect on soil P composition (random factor).

Supplement S4 – Latitude effect on soil P composition (random factor).

Supplement S5 – Percentage of P extracted with NaOH EDTA effect on soil P composition (random factor).

Supplement S6 – Soil properties and soil organic phosphonates.

Supplement S7 – Climatic properties and soil inorganic phosphorus.

Supplement S8 – Climatic properties and soil organic phosphorus.

Supplement S9 – Soil weathering stages and poorly crystalline Al and Fe concentration.

Supplement S10 – Models tested to explore the interdependences between edaphic and climatic variables (path analysis) as the main environmental predictors of soil inorganic and organic P compounds.

Supplement S1 - Dataset

The dataset of “**Environmental drivers of soil phosphorus composition in natural ecosystems**” is provided as a supplementary Excel file in “Deiss, L., Moraes, A., and Maire, V. Data from: Environmental drivers of soil phosphorus composition in natural ecosystems, Biogeosciences, bg-2017-307. doi:10.5061/dryad.f45f410”. Please cite the dataset reference along with the manuscript reference if the dataset is to be used in any publication.

Supplement S2 – Global biomes according to the Whittaker' diagram

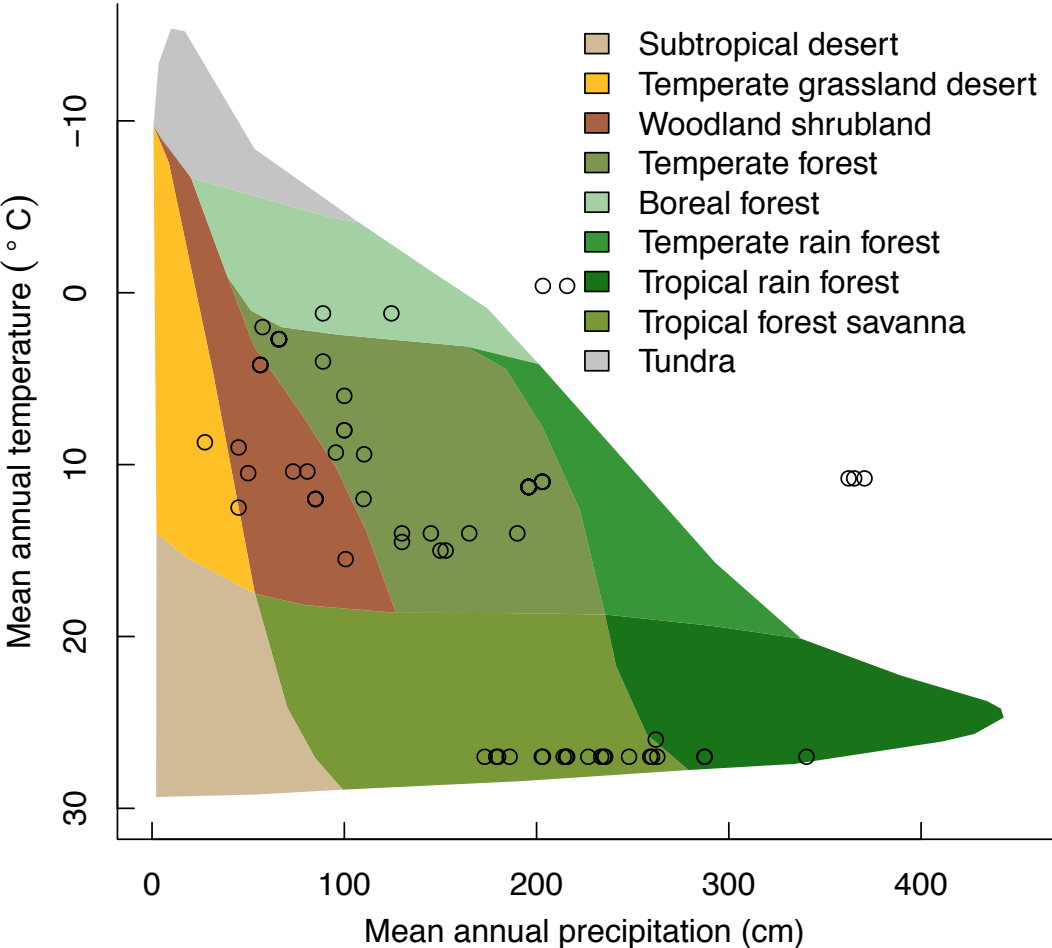


Figure S2. The Whittaker' diagram used to determine the main biomes comprised in our dataset.

Supplement S3 – Soil depth effect on soil P composition

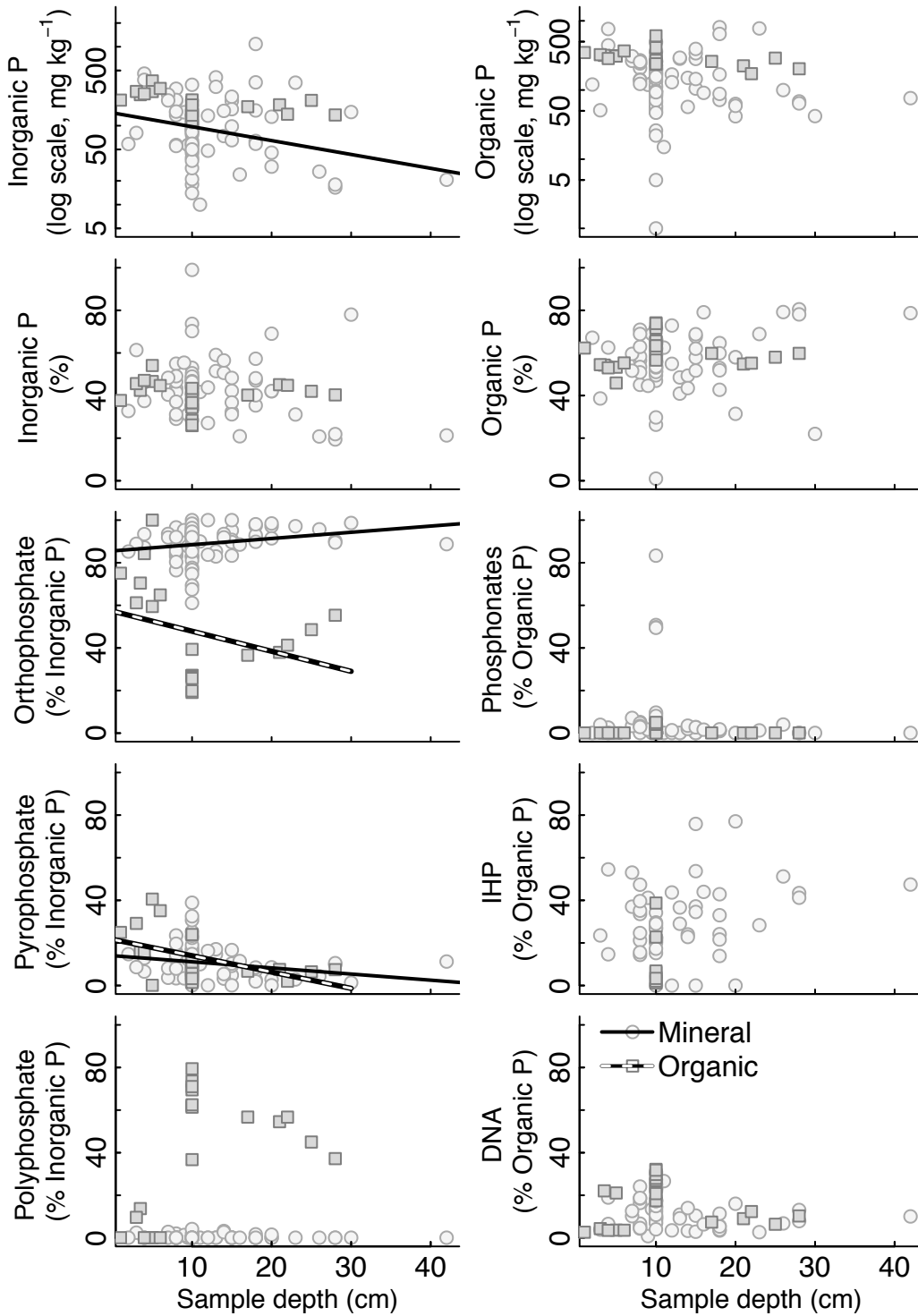


Figure S3. Soil inorganic and organic phosphorus (P) composition in NaOH EDTA extract as influenced by soil sampling depth on terrestrial natural ecosystems. Significant relationships are indicated with regression lines.

Supplement S4 – Latitude effect on soil P composition

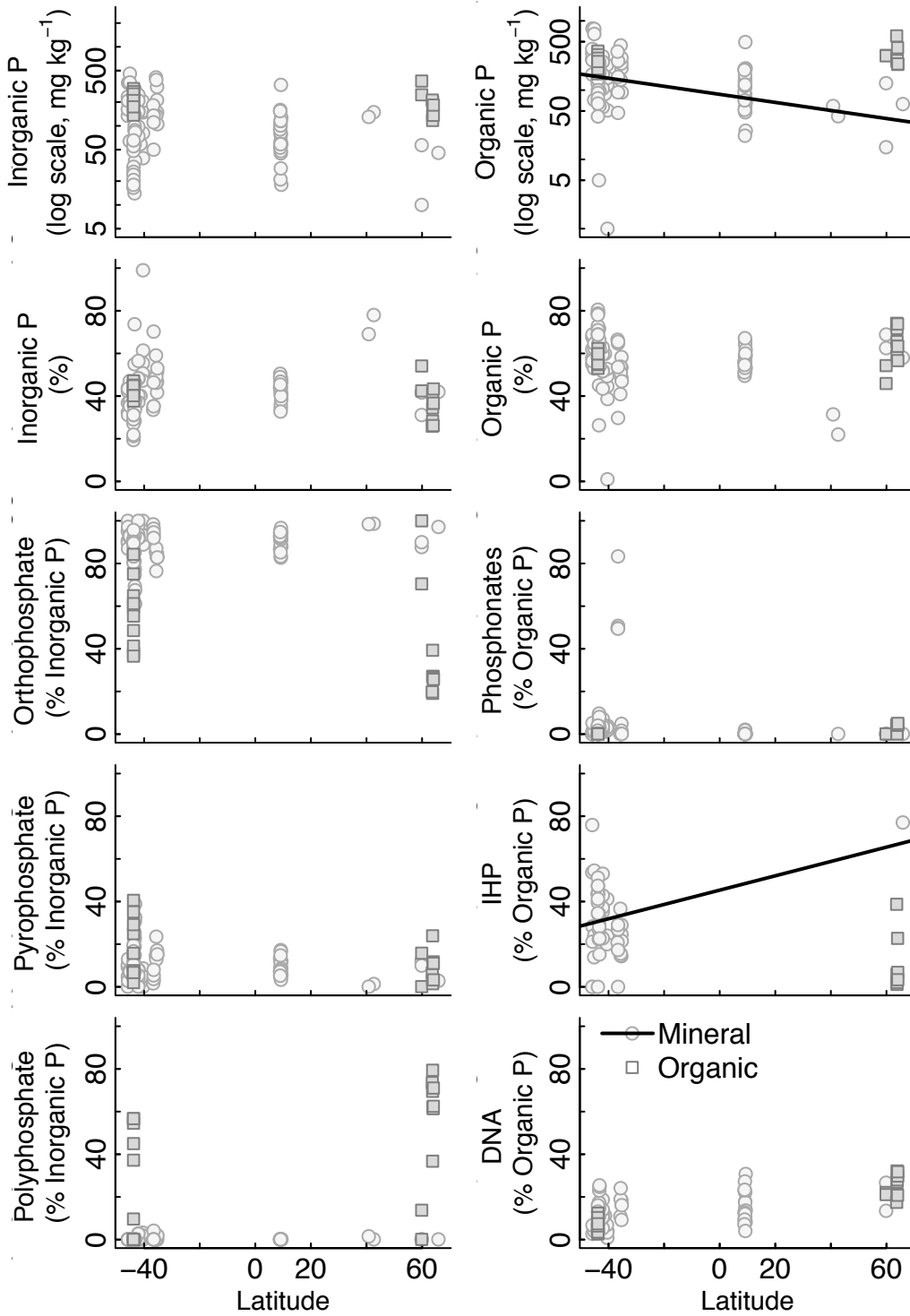


Figure S4. Soil inorganic and organic phosphorus (P) composition in NaOH EDTA extract as influenced by latitude on terrestrial natural ecosystems. Significant relationships are indicated with regression lines.

Supplement S5 – Percentage of P extracted with NaOH EDTA effect on soil P composition

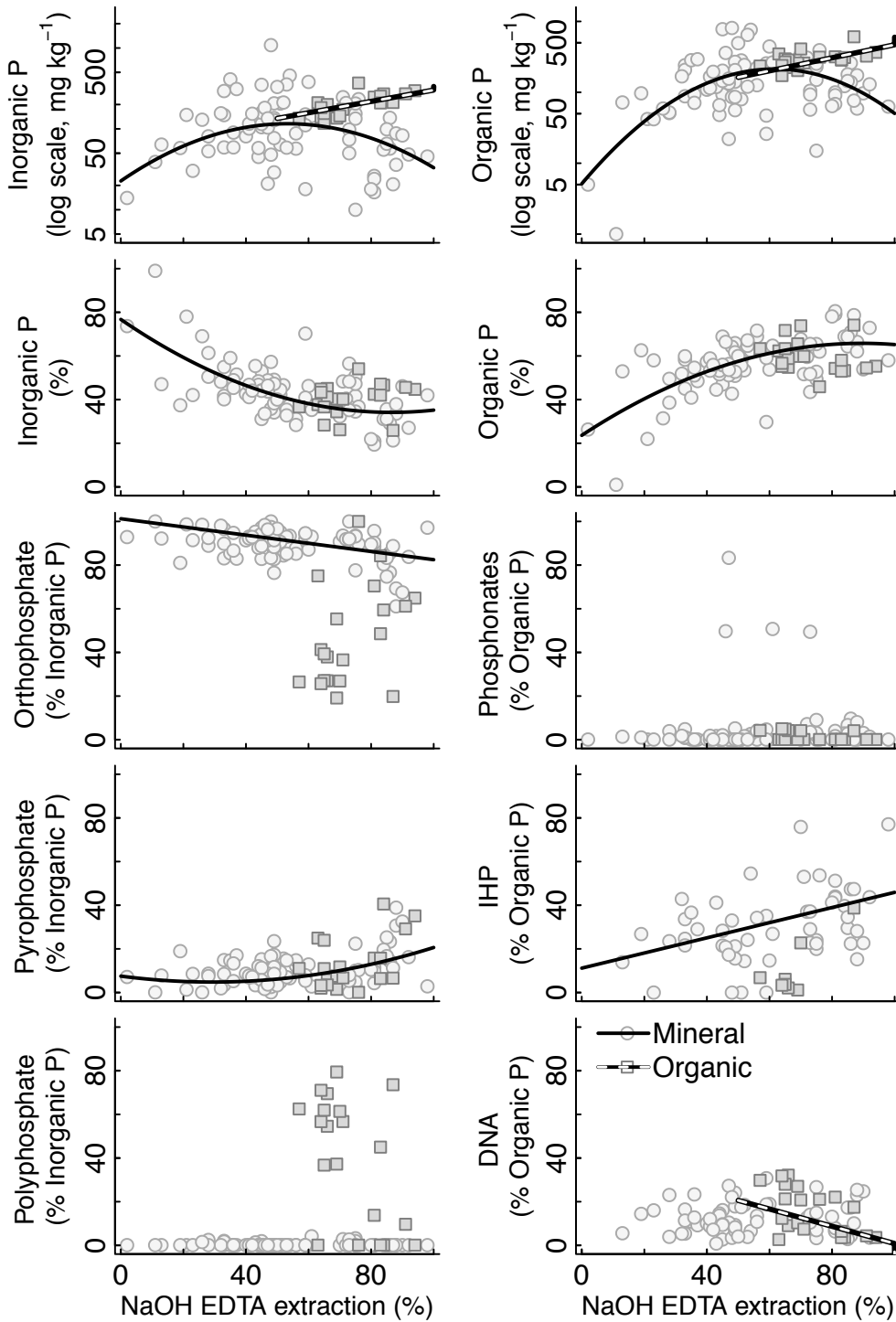


Figure S5. Soil inorganic and organic phosphorus (P) composition in NaOH EDTA extract as influenced by soil sampling depth on terrestrial natural ecosystems. Significant relationships are indicated with regression lines.

Supplement S6 – Soil properties and soil organic phosphonates

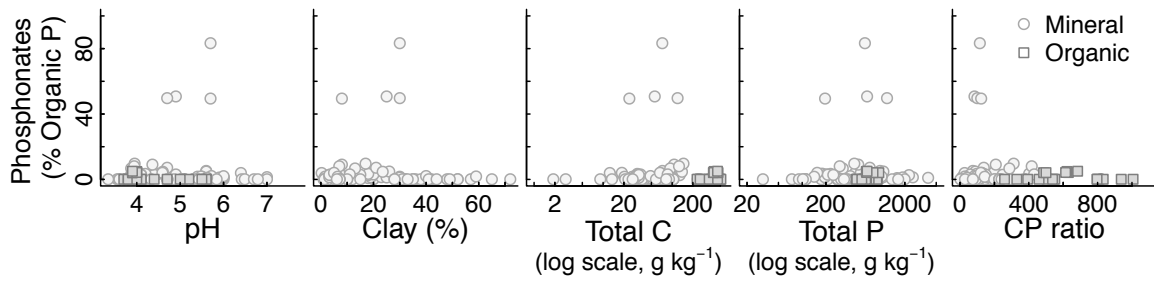


Figure S6. Relationship between edaphic properties and soil organic phosphonates in NaOH EDTA extract from soil mineral and organic layers on terrestrial natural ecosystems. No significant relationships were found.

Supplement S7 – Climatic properties and soil inorganic phosphorus

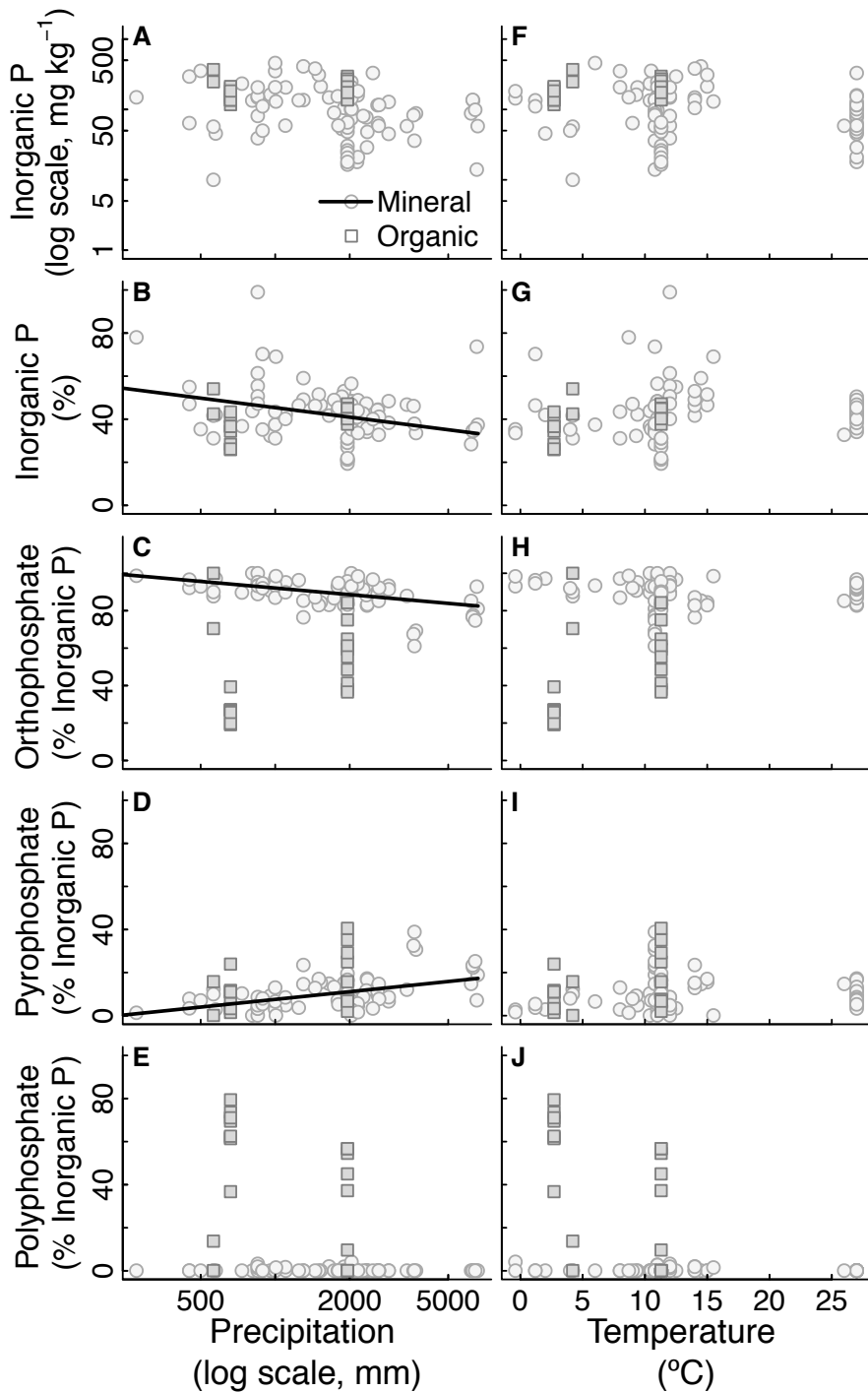


Figure S7. Relationship between climatic properties and soil inorganic phosphorus (P) composition in NaOH EDTA extract from soil mineral and organic layers on terrestrial natural ecosystems. Regression models ($n = 80$ mineral layer and $n = 20$ organic layer): mineral layer, total P_i (%) = $89.4 - 14.7 \log(\text{precipitation})$, $r^2 = 0.08$; mineral layer, orthophosphate = $127 - 11.7 \log(\text{precipitation})$, $r^2 = 0.24$; mineral layer, pyrophosphate = $-28.1 + 11.9 \log(\text{precipitation})$, $r^2 = 0.24$.

Supplement S8 – Climatic properties and soil organic phosphorus

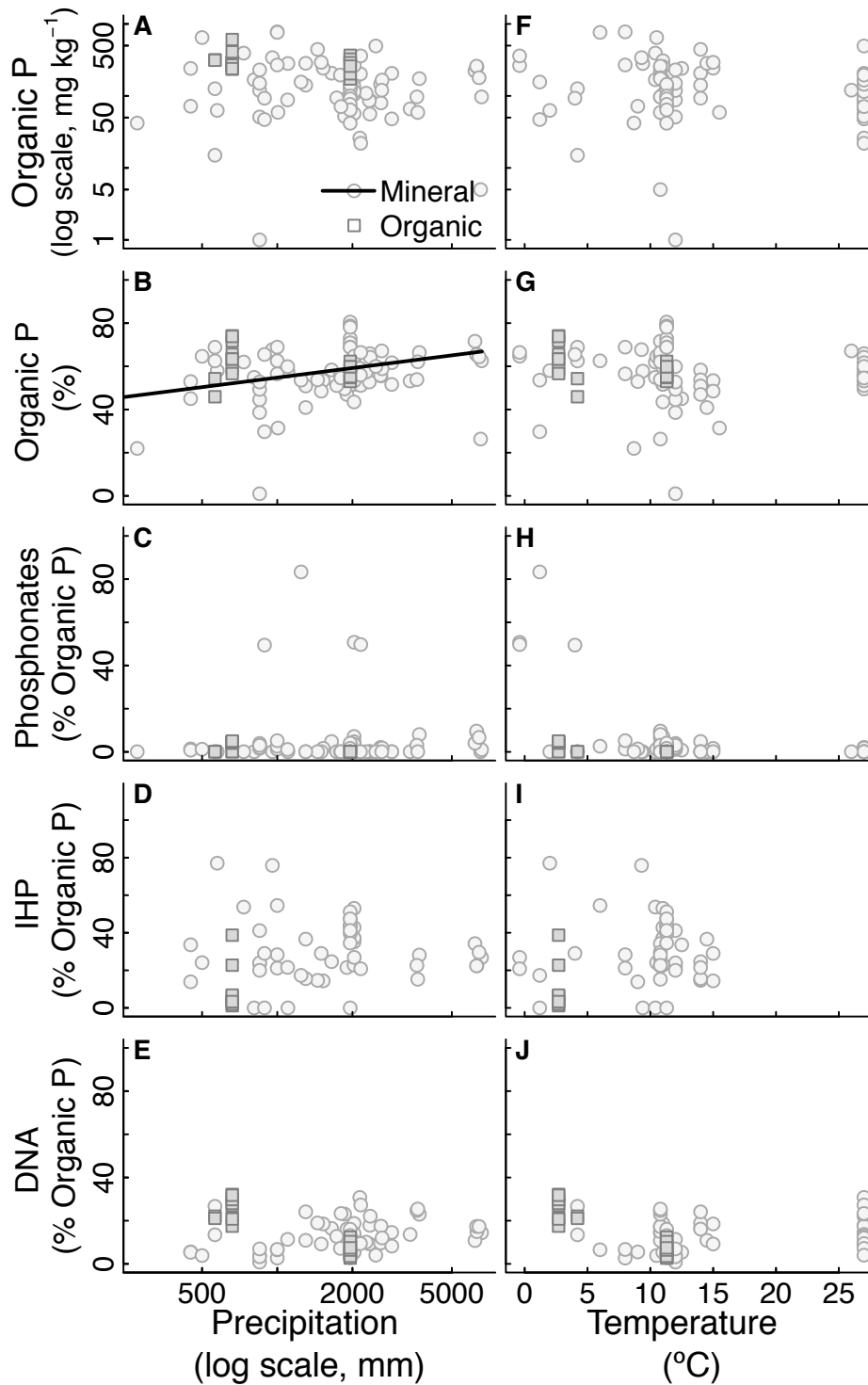


Figure S8. Relationship between climatic properties and soil organic phosphorus (P) composition in NaOH EDTA extract from soil mineral and organic layers on terrestrial natural ecosystems. Regression models: mineral layer, total P_o (%) = 10.6 + 14.7 log(precipitation), r² = 0.08 (n=80).

Supplement S9 – Soil weathering stages and poorly crystalline Al and Fe concentration

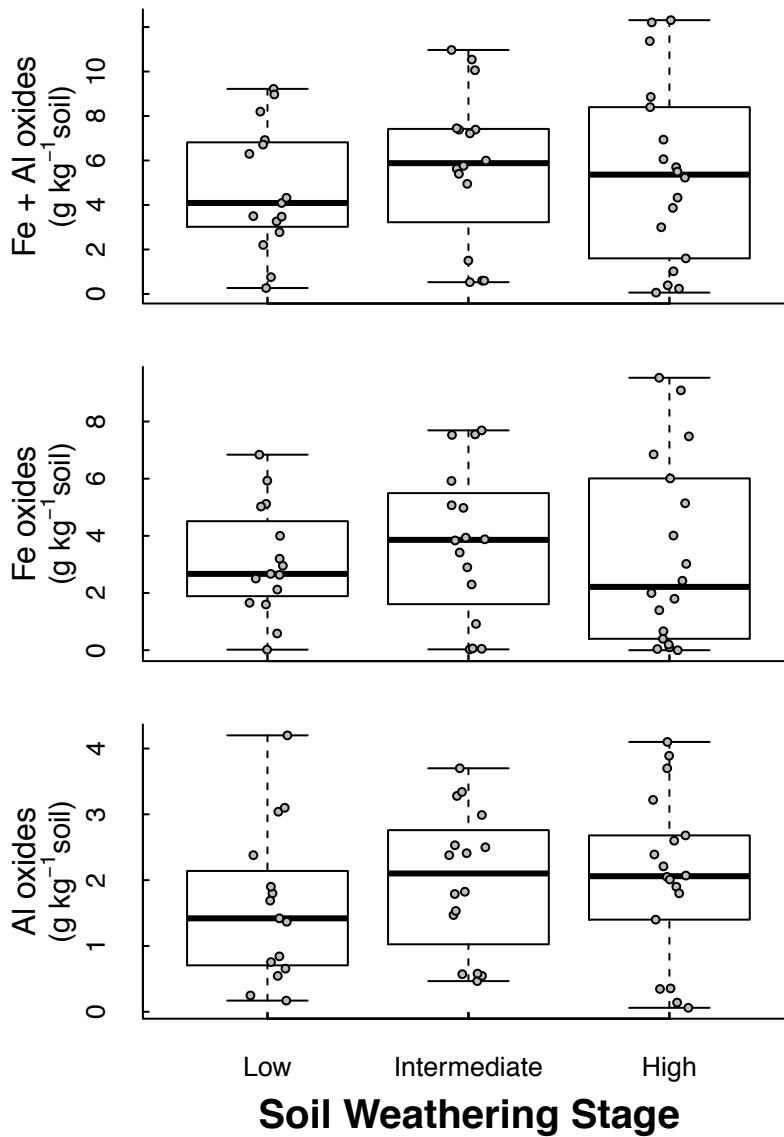


Figure S9. Soil weathering stage relationship with soil poorly crystalline Al and Fe (n = 49) on terrestrial natural ecosystems. For all three panels $p > 0.1$.

Supplement S10 – Models tested to explore the interdependences between edaphic and climatic variables (path analysis) as the main environmental predictors of soil inorganic and organic P compounds.

We expected some directionalities in the relationships, based on the literature (theoretical models on Figures S.10.1 and S10.2, top panels).

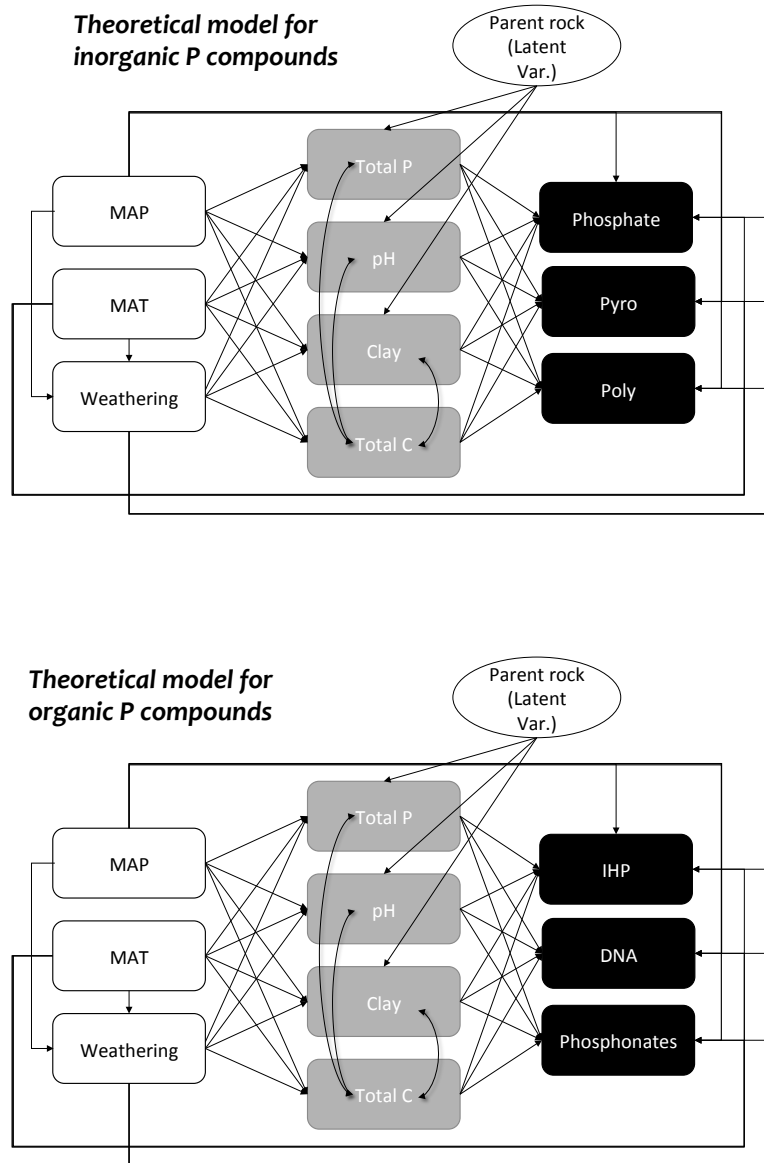


Figure S10.1. Theoretical models set to explore the interdependences between edaphic and climatic variables (path analysis) as the main environmental predictors of soil inorganic (upper panel) and organic (bottom panel) P compounds.